CDC 10 (963) DTZS
ICS 01.100.40

DRAFT TANZANIA STANDARD

Black Lead Pencil - Specification

TANZANIA BUREAU OF STANDARDS

1st Edition

0 Foreword

This Draft Tanzania Standard is being developed by Stationery and Paper Products Technical Committee under supervision of the Chemical Division Standards Committee and it is in accordance with the procedures of the Bureau.

This Tanzania Standard has been prepared with assistance drawn from:

> IS 1375:1981 *Specification for Black Lead Pencils*, published by Indian Bureau of Standards.

For the purpose of deciding whether a particular requirement of this Tanzania Standard is complied with, the final value observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with TZS 4.

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Black Lead Pencil - Specification

1 Scope

This draft Tanzania Standard specifies the requirements, sampling and test methods for Black Lead Pencil.

2 Normative references

The following referenced documents are indispensable for the application of this document. The latest edition of the referenced document (including any amendments) applies;

TZS 4 Rounding off numerical values

3 Terms and definitions

For the purpose of this draft Tanzania Standard the following definitions shall apply:

3.1 black lead pencil
pencil in which the slip, made basically of graphite and clay, is fixed in a wooden casing

3.2 drawing pencil
black lead pencil, in different grades; intended for drawing purposes

3.3 carpenter's pencil
black lead pencil used by carpenters for marking on wood

3.4 stenographer's and reporter's pencil
black lead pencil used by stenographers and reporters for writing in shorthand

3.5 general writing pencil
black lead pencil used for general purposes

4 Types and grades

4.1 Types
Pencils shall be of following types:
a) Drawing pencils,
b) Carpenter's pencils,
c) Stenographer's and Reporter's pencils, and
d) Pencils for general writing:

4.2 Grades
4.2.1 Drawing pencils shall be supplied in the following grades, as specified by the manufacture;

6B; 5B; 4B; 3B; 2B; B; HB; H; 2H; 3H;4H; 5H; and 6H.

NOTE - B denotes softness and darkness of pencil and H denotes the hardness of pencil. For example, pencil of grade 6B is the softest, darkest pencil and pencil of grade 6H is the hardest, lightest

4.2.2 Pencils for carpenters and for stenographers and reporters shall generally be of grade HB only.
4.2.3 Pencils for general writing shall be supplied in the following grades:

Hard-H,2H;
Medium - HB; and
Soft -B, 2B.

5 Requirements

5.1 Material and workmanship

5.1.1 Slip

The slip shall be in one piece, of uniform grading, free from grittiness and so basically made of graphite and clay as to produce smooth, even and uniform writing. It shall be sufficiently strong to withstand sharpening by a sharp knife or standard pencil sharpener and shall not break on mending or writing.

4.1.2 Casing

The casing shall be made from pencil slats. It shall be readily cut with an ordinary pocket knife with a reasonably sharp blade. When sharpened with a standard pencil sharpener, the wood shall take a smooth and even finish. Both halves of the wood casing shall be securely glued together throughout their length. The casing shall enclose the slip in a neat. secure manner, in such a way that the slip is centered. The warpage in 80 percent of the sample shall not exceed 0.5 mm, and in the remaining 20 percent of the sample, the warpage shall not exceed 1.0 mm.

4.1.3 Shapes

Carpenter's pencils shall be oval in section; Stenographer's and reporter's pencils shall be round, and the section of all other categories of -pencils shall be round or hexagonal, as specified by the Manufacture.

4.2 Specific requirements.

The Pencil, when tested according to the methods prescribed in Annexes A, B, C and D shall comply with the specific requirements given in Table 1.

Table 1 Specific requirements for Pencil

S/No.	Property			Requirement	Test method
i.	Blackness of Pencil Marking,% reflectance	Stenographer's and reporter's		68±3	Annex A
		General writing pencils,	hard grade	7l ±2	
			medium grade	70±2	
			soft grade	66±2	
		Carpenter's pencils		70±3	
		Drawing pencils	Grade 6H	77±1	
			Grade 5H	75±1	
			Grade 4H	74±1	
			Grade 3H	73±1	
			Grade 2H	71±1	
			Grade H	69±1	
			Grade HB	68±1	
			Grade B	66±1	
			Grade 2B	65±1	
			Grade 3B	63±1	
			Grade 4B	62±1	
			Grade 5B	60±1	
			Grade 68	59±1	
ii.	Friction of Slip, max			0.2	Annex B
iii.	Chemical Inertness of Pencil Markings			To pass test	Annex C
iv.	Gluing and Warpage of Wood Casing			To pass test	Annex D

5.Dimensions requirements

5.1 Dimensions.

5.1.1 The length of the pencils shall be 177±3 mm.

5.1.2 The diameter of pencils, other than carpenter's pencils, shall be between 7.5 and 8.0 mm for varnished or lacquered pencils and between 7.0 and 7.6 mm for unvarnished and unlacquered pencils. In the case of hexagonal pencils, the diameter shall be taken as the distance between any two opposite corners.

5.1.3 The cross-section of the carpenter's pencils shall be oval with the ends of the major axes trimmed straight. The dimensions of the cross sections of carpenters' pencils shall be as indicated in either Fig. 1 A or Fig. 1 B.

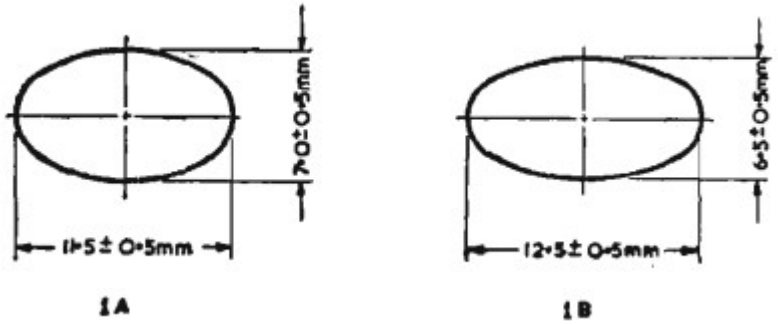


Figure 1 Cross Section of Carpenters Pencils

5.1.4 The diameter of slips used in the manufacture of pencils, shall be as under:

No	Pencils	Grades	Diameter of Slip mm
1	Drawing pencils,	6H,5H,4H, 3H, 2H, H and HB	1.90 - 2.30
		2B, 3B and 4B	2.10 - 3.20
		5B and 6B	3.50 - 3.60
2	Stenographer's and reporter's pencils,	HB	2.10 - 3.00
3	General writing pencils,	2H, H, HB	1.90 - 2.30
		B,2B	2.l0 - 3.20
4	[a] Carpenter's pencils,	HB	4.4 - 5.0
			2.0 -2.5
[a] slips of carpenter's pencils shall be rectangular			

5.1.5 Pencils in one carton shall be of the same dimension.

6. Packing and marking

6.1 Packing

Pencils shall be packed in a suitable package that withstand normal handling and transportation and that will prevent breakage of the product.

6.2 Marking

Each pencil shall be legibly and indelibly labelled with the following information:
a) the name and trade-mark of the manufacturer or the supplier.
b) grade. and
c) other indications which may be specified by the manufacture.

Each package of pencil shall be legibly and indelibly labelled with the following information;

a) the name and trade-mark of the manufacturer or the supplier
b) type and grade of pencils.
c) quantity of pencils contained therein.

5 7.Sampling

Sampling for Pencils shall be done as per Annex E

5 8.Testing

Methods of tests for Pencils shall be as prescribed in the annexes.

Annex A
(normative)
Determination of blackness of Pencil markings

A1 Apparatus

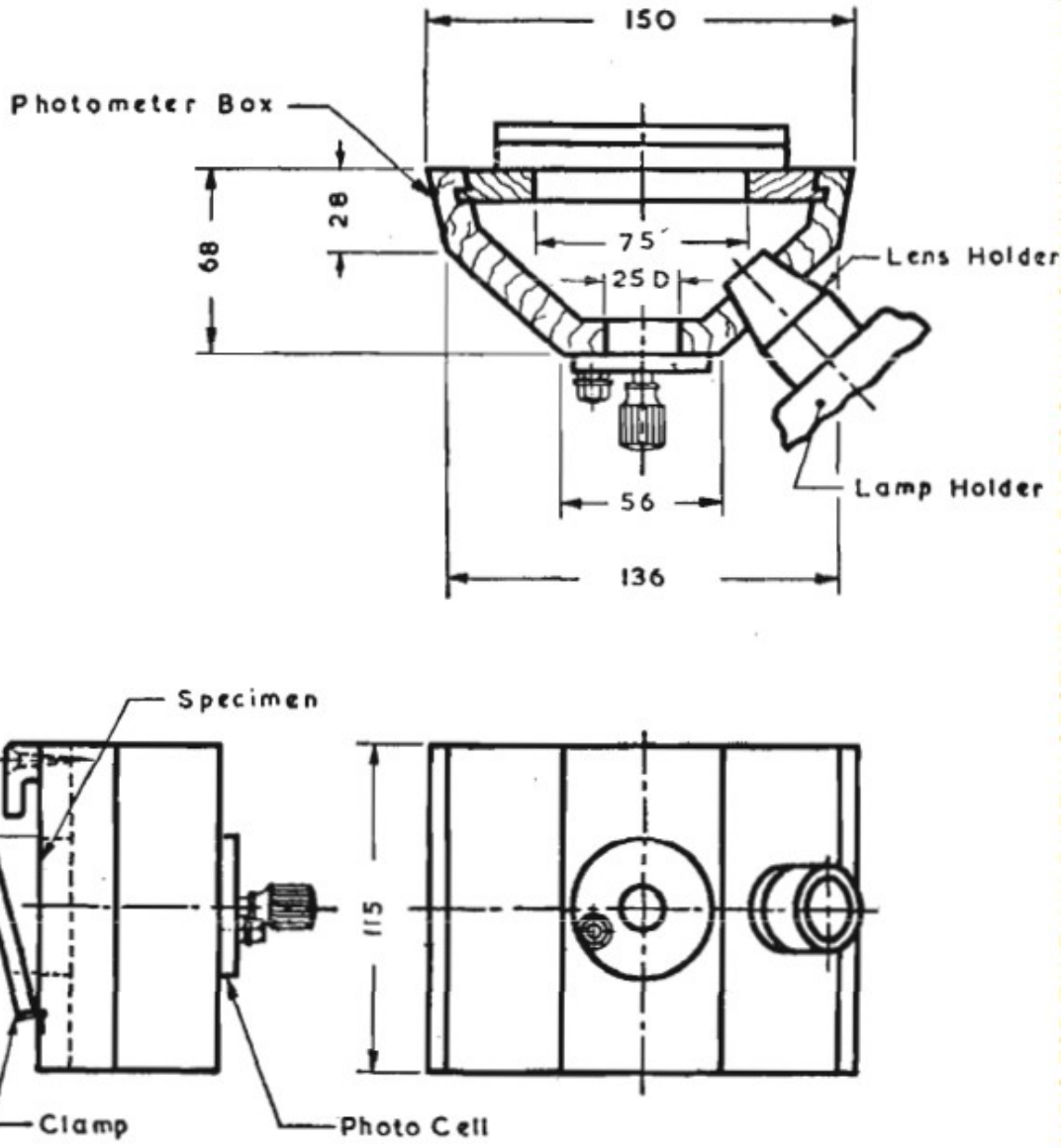
A 1.1 Marking of Pencil Lines

A Whatman drawing paper shall be used. The reflectance value of this paper shall be 79±2.

A I.2 Measurement of Blackness of Pencil Markings

The apparatus shall consist of a box where light shall be incident on the pencil marking at an angle of 45° and the reflected light in a direction perpendicular to the markings shall be received by a photocell which shall be connected to a sensitive galvanometer (See Figure 2). The box shall be painted from inside with a white paint giving a matt surface. To the output of the photocell and in series with the circuit, a suitable opposing electromotive force shall be applied by using a dry cell and variable resistance, so that the difference in the reflectance values shall be magnified by appropriately controlling the sensitivity of the galvanometer (by using a shunt). The reflectance values shall be in the scale of zero reflectance for a perfectly black flat surface and 100 percent reflectance for a perfectly white flat surface ($MgCO_3$ block).

Thin metal or plastic plates of known reflectance values may also be taken. If three such plates are taken with reflectance values approximately in the range 58 to 72 and placed in the box, the galvanometer readings may be plotted against the known reflectance values. This graph, which is a straight line, may be used to convert the galvanometer readings to reflectance values.



All dimensions in millimetres

Figure 2 Blackness Indicator

A 1.3 The reflectance measurements shall be made with the help of the apparatus described above or any other similar apparatus.

A-2. Procedure

A 2.1 The slip shall be cut square to its length and the end made flat by drawing a few lines, first on a sand paper and then on a drawing paper.

Thirty parallel lines, each of 12 cm length and spaced 1.5 mm from their centres, shall be drawn on the drawing paper.

A-2.2 The paper with the markings shall be placed in the box and reflectance readings shall be taken at three different ' positions of the markings. The mean value of these three readings shall be the blackness of the Pencil markings.

Annex B
(normative)
Determination of friction of Pencil slip

B 1. Apparatus

B 1.1 The apparatus for carrying out this test shall consist of a trolley, 635 mm long and 127 mm wide (see Fig. 3). A Whatman drawing paper of the size of the trolley shall be fixed on it. The trolley shall move on two rails, 122 cm long, at a speed of about 69 mm per second. The trolley shall be connected by means of a string to the rotating pulley of an electric motor.

B I.2 Three pencil holders shall be fixed to a triangular stand such that the distance between any two pencil holders as also the height of the stand shall be 50.8 mm. The total weight, including the weight of the holders and stand on the three pencil slips, shall be 640±3 g. The load shall be distributed equally on the three slips.

B 1.3 A string shall be attached to the Pencil stand and the other end connected to a pointer and weight arrangement, so that the force experienced by the stand is measured. The pointer readings shall be calibrated as follows:

The distance between the wooden stand and the torque meter should be kept constant. The thread connecting the pencil and the lower end of the pointer shall be disconnected from the pencil stand and replaced by a longer thread which can pass over both the pulleys and through a hole in the wooden stand. Weights shall be attached to this end of the thread and the pointer readings shall be noted down. A graph of the pointer readings and the weight is drawn and may be used to convert the pointer readings to weight in grams.

B 2. Procedure

B 2.1 Three pieces from the same slip shall be cut square to their length and fixed in the holders. The upper surface of the stand shall be horizontal and 50.8 mm from the ends of the slips.

B.2.2 The Whatman paper shall be fixed to the top of the trolley and the trolley shall be kept on the extreme position on the rails towards the pointer scale. The pencil stand shall be kept on the other end of the paper. The trolley shall then be pulled. The pencil stand will be dragged along with the trolley due to friction. This frictional force shall be balanced by the pointer and weight arrangement.

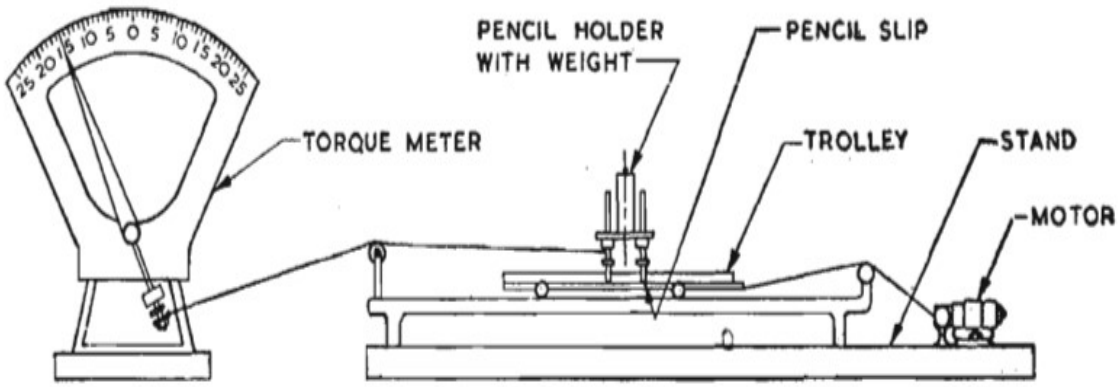


Figure 3 Apparatus for Measurement of Pencil slip friction

Annex C
(normative)
Chemical Inertness of Pencil Markings

When a paper marked with pencil lines is dipped in hydrogen peroxide, it shall not be affected by the latter.

Annex D
(normative)
Gluing and Warpage of Wood Casing

Finished pencils shall be kept for 48 h in a desiccator filled with water (TZS 59). The casing shall not separate.

Annex E
(normative)
Sampling

E.1 Sampling.

The following sampling procedure shall be applied in determining whether a lot complies with the relevant requirements of the specification. The samples so drawn shall be deemed to represent the lot for the respective properties.

E-2 From the lot take at containers/packages containers/packages and, after inspecting each of them, use one container/ package for testing for compliance with the requirement for shelf life. After thoroughly mixing the contents of each of the remaining containers/ packages, by taking an approximately equal quantity of product from each container/package.

E-3 Clearly mark the name of the product, the manufacturer's name or trademark, the batch identification and the date of sampling on the sample container/ package.

E-4 Compliance with the specification

The lot shall be deemed to comply with the requirements of the specification if, after inspection and testing of the samples taken in accordance with D.1, no defective is found.

D-5 Inspection
Inspect the containers taken in accordance with D.1 for compliance with the requirements in clause 4.